

CalNex Forecast Notes - Tuesday, May 18, 2010

California Synoptic Overview - Jason Branz (jbranz@arb.ca.gov)

Tuesday May 18

- Deep upper trough in the Gulf of Alaska
- Trough moving E into NV
- NW transport flow
- Onshore flow along the coast with low clouds

Wednesday May 19

- Cold front moves through Bay Area/Sac Valley
- Precip possible Bay Area northward
- Weak ridge for central/southern CA with weak offshore gradients

Thursday May 20

- Large upper low from GOA drops S toward PacNW
- Ridge is pushed farther south
- Transport flow turns W
- Onshore flow with coastal stratus in the south

Friday-Sunday May 21-23

- Large upper trough slowly pushes southward
- Smaller disturbances rotate around the trough through the weekend
- Precip chances from Monterey northward on Saturday
- Onshore surface flow for all coastal areas through the weekend

Anticipated Activities

WP-3D

Tue: No Flight

Wed: LA Basin and platforms comparison flights

Thu: No Flight

Fri: tentative Maersk vessel fuel switch

Sat: No Flight

note: evening & night flights begin May 23 for 10-14 days

NOAA Twin Otter

Wed: platforms comparison flights

NASA King Air

Wed: platforms comparison flights

R/V Atlantis

area between Pt. Conception and LaJolla

Local Features:

Wednesday: forecasts call for clouds in LA Basin in AM with inland clearing in PM - the later the flight, the clearer conditions will be for intercomparison flights in afternoon

Friday: ship fuel switch measurements - forecast indicates low water vapor and limited clouds off SoCal. However, indication of eddy forming off San Diego County; with strong NW flow and approaching trough, eddy could generate clouds.

Large Scale Transport Notes - Brad Pierce (brad.pierce@noaa.gov))

Intercontinental pollution coming onshore Friday

LA/SF AIRNOW Site Comparison

Good O3/Moderate PM2.5 LA&SF AQ during FX period
AIRNOW data restored. O3 analysis in good agreement, PM2.5 underestimated at Rubidoux

LA/SF AIRNOW Ensemble

Intermediate (24hr) LA transport route east during FX period. Long-range transport turning from north to south during FX period.
Intermediate (24hr) SF transport route northeast during FX period. Long-range transport bifurcating to during FX period.

500m RDF FX 00Z 05/19 (Tues Afternoon)

New Intercontinental CO enhancement offshore at 500m
O3/PM2.5 enhancement offshore
Weak (~5 ppbv/day) SF Moderate (5-10ppbv/day) LA background O3 P-L

500m RDF FX 00Z 05/20 (Wen Afternoon)

First Intercontinental CO/PM2.5 enhancement coming onshore, second wave still offshore
Some (~60ppbv) O3 enhancement over LA
Moderate (5-10 ppbv/day) background O3 P-L around LA
Lagrangian mean descent over LA

500m RDF FX 00Z 05/21 (Thu Afternoon)

Second Intercontinental CO/PM2.5 enhancement coming onshore in Northern CA,
clean air descending over Southern CA
Weak (~5 ppbv/day) background O3 P-L over LA&SF

500m RDF FX 00Z 05/22 (Fri Afternoon)

Second Intercontinental CO/PM2.5 enhancement onshore in Northern CA, high O3
air descending over Southern CA
Lagrangian mean descent over Southern CA
Significant (~60-80ppbv) O3 enhancement over South CA
Low (<5 ppbv/day) background O3 P-L over LA&SF

Area Forecast Details

San Francisco Bay Area - Danny Kam (dkam@airquality.org)

Tuesday

- W 5 to 10kt; NW 5 to 10kt in the early evening
- Less onshore flow in the morning: 30/40/30 (SV/FH/SJV), then 20/30/50 at night
- MBL mostly below 1,000 ft

Wednesday

- Light NW turning SW 5 to 10kt around sunrise; SW 5 to 10kt through the afternoon; NW 15 kt at night, gradually becoming stronger
- Onshore flow weak in the morning, stronger in the afternoon
- Bifurcation 50/50 (SV/SJV) in the morning; 40/30/30 (SV/FH/SJV) rest of the day
- MBL below 500 ft

Thursday

- NW 20kt becomes 30kt in the afternoon, gradually decrease at night
- Moderate onshore flow, bifurcation 20/40/40 (SV/FH/SJV)
- MBL 1,000 ft, will increase to 2,500 ft

Friday

- NW 20 to 25kt all day, except weakens briefly to 15 to 20kt around noon
- AM MBL 3,000 ft

Saturday

- Strong NW wind subsiding, become light W on Saturday afternoon

Sacramento Valley - Danny Kam (dkam@airquality.org)

Tuesday

- SE 5 kt (northern SV); otherwise, S to W 5 to 10kt
- Limited downslope flow
- PM PBL 5,500 ft

Wednesday

- S to W 5 to 10kt (light SE for northern SV in early AM), shifts NW overnight
- Some downslope flow
- COAMPS shows eddy west of Walnut Grove and north of the delta
- AM PBL 500 ft; PM PBL 3,000 to 5,000 ft

Thursday

- NW 5 to 10kt in the morning decreasing to 5kt in the afternoon and turning SW in the evening
- AM PBL 1,000 ft; PM PBL 5,000 to 8,000 ft

Friday

- NW 5kt
- No AM downslope flow
- AM PBL 1,500 ft

Saturday & Sunday

- Light WNW becomes stronger SW

San Joaquin Valley - Jennifer Ridgway (Jennifer.Ridgway@valleyair.org)

TUESDAY MAY 18

Surface Winds

Wind Profilers: The profilers at Tracy, Chowchilla, and Visalia indicate light SE flow to S flow throughout the atmospheric profiles. The profiler at Lost Hills indicates light E to NE flow up to 2,600 feet AGL becoming moderate NW flow above.

SJV Surface Obs: 7:00 Temperatures in the high 50s and calm conditions to light winds across most of the valley. Partly sunny skies from Fresno County northward and cloudy skies from Kings County southward. 9:00 obs and visible satellite image showing skies starting to clear over southern SJV with partly sunny skies over Bakersfield.

CANSAC 00Z

Calm to light N flow over Delta predicted during early morning becoming onshore by 17:00. Onshore flow over Altamont and Pacheco Passes predicted during early morning becoming offshore during late morning then onshore again by 17:00.

Calm to light flow across the valley and **outflow over Cottonwood Pass in the morning**. Moderate NW flow across valley in afternoon with moderate outflow over Tehachapi and Tejon Passes. **Afternoon flow over Cottonwood Pass becomes NW inflow.**

Boundary Layer Mixing -- **Note: Minimal to no mixing occurs after sunset and prior to sunrise due to the absence of surface heating.**

Morning Aircraft Soundings: Morning soundings for Fresno and Bakersfield were not available. The wind Profilers at Chowchilla and Lost Hills indicated no virtual temperature inversions throughout the atmospheric profiles.

CANSAC 00Z run:

Mixing predicted to improve to 6,500 feet by 17:00. Best heights over the central San Joaquin Valley particularly along the Highway 99 corridor and also western San Joaquin County. The lowest heights 600 to 1,000 feet are predicted over western Merced County.

Air Quality -- Air quality good under good dispersion. No exceedances expected.

WEDNESDAY MAY 19**Surface Winds****CANSAC 00Z**

Light to moderate onshore flow through the Delta and over Altamont and Pacheco Passes throughout the day. Calm to light flow across the valley in the morning becoming moderate NW flow by 17:00. Onshore flow over Cottonwood Pass in the morning predicted to become offshore in afternoon. Outflow over Tejon and Tehachapi passes during afternoon.

Boundary Layer Mixing**CANSAC 00Z run:**

Expect height to improve to the 5,000 feet range with the best areas predicted to be along the highway 99 corridor. The lowest heights in the 0 to 75 feet range predicted over south central Stanislaus County and 600 to 1,000 feet range are predicted over San Joaquin County.

Air Quality -- Air quality good to moderate under deteriorating dispersion. No exceedances expected.

THURSDAY MAY 20**Surface Winds****CANSAC 00Z**

Light onshore flow through Delta predicted during morning and early afternoon becoming N by 17:00. Moderate onshore flow over Altamont and Pacheco Passes throughout the day. **Interesting flow north of the Pacheco Pass region (on boundary between Stanislaus and Santa Clara Counties) by 17:00.** Light to moderate NW flow across portions of northern and central SJV and light S flow across Kern County in the morning. Light inflow over Cotton wood Pass and moderate outflow over Tejon and Tehachapi Passes in the morning. Moderate NW flow across the valley and moderate outflow over Cottonwood, Tejon, and Tehachapi Passes by 17:00.

Boundary Layer Mixing

CANSAC 00Z run: Expect height to improve to the 5,000 feet range, the best areas predicted to be over San Joaquin

County, western Stanislaus County, northwestern Tulare County, and Kern County.

Air Quality -- Air quality good to moderate, marginal dispersion. No exceedances expected.

Potential Targets

Kern County best target on Wednesday and Thursday in terms of air quality issues although no exceedances are expected. Flow feature north of Pacheco Pass (on boundary between Stanislaus and Santa Clara Counties) on Thursday could be a good target also.

FRIDAY MAY 21

(GFS 00Z): Surface charts show pressure gradients tightening with W flow across SJV.

http://www.rap.ucar.edu/weather/model/displayMod.php?var=gfs_sfc_mslp&hours=hr072hr084hr096hr108hr120

Boundary Layer Mixing: Clear skies forecast for the San Joaquin Valley which will allow good surface heating by 17:00 so expect heights to improve to the 5,000 to 6,500 feet range.

Air Quality -- Air quality good to moderate under improving dispersion. No exceedances expected.

-

SATURDAY MAY 22

(GFS 00Z): Surface charts show pressure gradients tightened with NW flow across SJV.

http://www.rap.ucar.edu/weather/model/displayMod.php?var=gfs_sfc_mslp&hours=hr072hr084hr096hr108hr120

Boundary Layer Mixing Clear skies forecast for the San Joaquin Valley which will allow good surface heating by 17:00 so expect heights to improve to the 5,000 to 6,500 feet range.

Air Quality -- Air quality good under good dispersion. No exceedances expected.

Central Coast - Gary Arcemont (garcemont@co.slo.ca.us)

Monday 5/17: Cloudy, drizzle, light showers. Ozone dropped to background 36-43 ppb max 8 hr avg

Current Wx: Cloudy, light showers. Well mixed atmosphere. VBG: elevated inv 4.8C@1414m AGL, 6.2 C @ 1666m AGL

Synopsis 5/18 – 5/23: NW flow increases Wednesday through Monday afternoons. NW flow aloft. Blowing dust in afternoons – Oceano Dunes/Nipomo Mesa Wednesday through Monday. Sundowner winds possible Gaviota- SBA Weds-Sunday

Today Tuesday 5/18: Trough over Great basin. Cloudy - Slight Chc showers AM
Flow aloft -SW flow early NE late

Wednesday: Weak ridge over CA. Trough approaches CA. NW flow aloft. Blowing dust in afternoon – Oceano Dunes/Nipomo Mesa

Thursday: Trough No. CA, NW flow aloft. Blowing dust in afternoon/Moderate AQ – Oceano Dunes/Nipomo Mesa

Friday: Trough deepening over CA, NW flow aloft. Blowing dust in afternoon/Moderate AQ – Oceano Dunes/Nipomo Mesa

Saturday: NW flow aloft. Deep trough W. US Blowing dust in afternoon/Moderate AQ – Oceano Dunes/Nipomo Mesa

Sunday: NW flow aloft. Deep trough W. US Blowing dust in afternoon/Moderate AQ – Oceano Dunes/Nipomo Mesa

Air quality: Good air quality with exception - Blowing dust in afternoons/Moderate AQ – Oceano Dunes/Nipomo Mesa - Wednesday through Monday.

Significant features for study: Blowing dust Oceano Dunes/Nipomo Mesa peaking midday/afternoons - Wednesday – Monday , max PM10 Fri-Sat PM

SoCal Coastal Waters - Lee Eddington (Lee.Eddington@navy.mil)

+ Tuesday afternoon (00Z 19 May)

- Marine Low Clouds
 - * SCT/BKN StCu Crescent City to San Diego
- SOCAL Marine Layer Winds
 - * W 8-12 kts inner waters
 - * WNW 10-15 kts outer waters

+ Wednesday morning (12Z 19 May)

- Marine Low Clouds
 - * BKN/OVC St/StCu Crescent City to Cape Mendocino

- * SCT St/StCu Cape Mendocino to Palos Verdes
- * BKN/OVC St Palos Verdes to San Diego
- SOCAL Marine Layer Winds
 - * LT VAR inner waters with easterly flow Los Angeles to Santa Barbara
 - * NW 15-25 kts outer waters

+ Wednesday afternoon (00Z 20 May)

- Marine Low Clouds
 - * OVC NiSt rain Crescent City to San Francisco
 - * CLR San Francisco to Palos Verdes
 - * SCT/BKN StCu Palos Verdes to San Diego
- SOCAL Marine Layer Winds
 - * W 5-10 kts inner waters
 - * WNW 15-30 kts outer waters

+ Thursday morning (12Z 20 May)

- Marine Low Clouds
 - * SCT/BKN StCu/Cu w/ rain showers Crescent City to San Francisco
 - * SCT/BKN StCu San Francisco to Point Arguello
 - * CLR Point Arguello to Palos Verdes
 - * SCT/BKN St Palos Verdes to San Diego
- SOCAL Marine Layer Winds
 - * LT VAR inner waters
 - * WNW 10-25 kts outer waters

+ Thursday afternoon (00Z 21 May)

- Marine Low Clouds
 - * SCT/CLR Crescent City to San Diego
- SOCAL Marine Layer Winds
 - * WNW 20-30 kts inner waters Point Conception to Point Mugu
 - * W 5-10 kts inner waters Point Mugu to San Diego
 - * WNW 15-30 kts outer waters

+ Friday morning (12Z 21 May)

- Marine Low Clouds
 - * SCT/BKN StCu/Cu w/ rain showers Crescent City to Cape Mendocino
 - * CLR/SCT StCu Cape Mendocino to Point Arguello
 - * CLR Point Arguello to Palos Verdes
 - * SCT/BKN St Palos Verdes to San Diego
- SOCAL Marine Layer Winds
 - * W 0-15 kts inner waters Point Conception to Point Dume
 - * ESE 0-10 kts inner waters Point Dume to San Diego
 - * WNW 20-35 kts outer waters

South Coast - Kevin Durkee (kdurkee@aqmd.gov)

- **Tuesday:** Weather system moves slowly; deep moist layer; onshore flow; afternoon mixing ~5000 feet at Downtown LA; light rain/drizzle through Tuesday Morning; slightly warmer afternoon temperatures as sun breaks through clouds, but still well below normal; cloudy through day; some gusty west winds mountains & deserts through this evening (WAD in Antelope Valley; AQ Good-Moderate)
- **Wednesday:** weak ridge builds overnight for a patchy marine layer to reform; shallower inversion; AM clouds to coast with some inland penetration, especially if coastal eddy in AM; mostly clear after noon inland; temperatures increase 10 or more degrees F inland from coast (low 80s inland); good sea breeze, gusty winds Antelope Valley; increasing ozone inland - mostly Moderate
- **Thursday:** weak trof to N starts to weaken the ridge over So Cal for more zonal flow; Basin temperatures remain at or slightly above seasonal norms; northerly flow push for breezy winds in I-5 corridor & LA County mountains (AM & PM); some marine layer clouds to coastal valleys; increasing ozone - mostly moderate but some USG inland possible
- **Friday:** cloud predictions for Friday are uncertain. Upper low in Pacific Northwest; weak troughing over So. Cal. for deeper marine stratus layer, cooler temps Fri compared to Thu; if inversion is intact on Thur, marine stratus layer may be dependent on subsidence inversion strength and could have trouble forming due to stronger dry NW flow associated with trough on Friday; COAMPS predicts most stratus south of Palos Verdes.
- **Sat- Tuesday:** after Friday expect deeper marine layer, onshore flow and cooler temperatures through the weekend; some gusty winds possible mountains & deserts; mostly Moderate ozone, but some USG with sun inland - mainly Central San Bernardino Mountains & into deserts

Long Term outlook from NWS

- **NWS Oxnard:** "A look at the longer range mdls continue to show a high amplitude blocking ridge across the east coast which keeps the long wave trof firmly over the west coast. All of which means warmer temps will be a long time coming."
- **NWS San Diego:** "The weather pattern gets stuck with a nearly stationary broad 576 trough over the western states friday through possibly the end of the month. The weakly cyclonic flow of this trough will be enough to maintain 1003 mb surface low pressure over the far interior... resulting in mod-strong 1-12 mb onshore flow and a 3-5 kft deep, persistent marine layer. That means a lot of stratus west of the mountains and 5-10 degrees below normal temps area-wide. The mountains & deserts will also be windy at times, particularly this friday PM into Sunday AM and again Tuesday-Wednesday of next week, when wind advisories may be needed."